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Firms' (non)responses: The role of ambivalence in the case of population aging in Japan

Ken Matsuno [a, b, *], Florian Kohlbacher [c]

[a] Marketing Division, Babson College, Babson Park, MA 02457-0310, USA
[b] Department of Marketing Management, ESADE —Ramon Llull University, Av. Torre Blanca, 59, 08172 Sant Cugat del Vallès, Barcelona, Spain
[c] The Economist Intelligence Unit, Economist Corporate Network, North Asia, The Economist Group, Tokyo 100-0006, Japan

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ABSTRACT

The literature supports and recommends that firms be responsive to external environments for prosperity and survival. However, many firms do not seem to heed this advice when it comes to important but uncontrollable environmental forces such as population aging. We investigate firms' (non)responses to population aging, one of the grand challenges of our time. While theoretical explanations for firms' responses to external environments abound, surprisingly, we lack concrete empirical evidence about why some companies do not respond to population aging while others do. Building on the cognition −response framework and utilizing a sample of 545 Japanese corporations, we investigate the magnitude and extent of organizations' corporate-level responses to population aging in Japan, the world's most aged society. While controlling for the firms' resource dependence and slack resources, we find robust, positive effects of perceived state certainty on organizational responses. Specifically, we find that perceived state certainty takes both direct and indirect routes (Daft and Weick 1984) to increasing firm response to population aging. We also find that firms' self-perceived controllability has a direct effect on firm response. Most intriguingly, the organization's ambivalence toward the implications of population aging on their business does not directly reduce firm response. Instead, it is found to be a quasi-moderator that interacts with perceived state certainty and negatively affects the responses to population aging. Ambivalence is an important factor that has been largely overlooked and warrants more research attention to address not only this particular grand challenge but also others (e.g., climate change).

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1. Introduction

"Because we didn't see it coming!" Experienced managers may have heard, or even used, this or a similar statement as a justification for managerial nonresponse. No manager can foresee all potential trouble and challenges, and it may not be reasonable to expect a meaningful response if the manager is not aware of the existence of the trouble or challenges he or she faces. However, organizations often fail to respond despite being aware of, or even having specific knowledge of, forthcoming problems. This is not only a curious academic question, it also has significant practical business and social implications.

* Corresponding author. Marketing Division, Babson College, Babson Park, MA 02457-0310, USA.
E-mail addresses: matsuno@babson.edu (K. Matsuno), floriankohlbacher@economist.com (F. Kohlbacher).

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The phenomenon of population aging in both industrialized and some emerging economies is a case in point. This has become an increasingly pressing social and business issue. The increasing proportion of older people in the population puts pressure on sustainability of pension systems and labor pools, as well as firms' existing product and service offerings (Harper, 2014; Kohlbacher and Herstatt, 2011) but also gives rise to new business opportunities (Kohlbacher et al., 2015). Peter Drucker pointed to the business implications of demographic change as early as 1951 and has repeatedly stressed their importance (Drucker, 1951, 2002). More recently, the issue of the grand challenge of population aging has received increased attention within the field of management studies (Chand and Tung, 2014; Kulik et al., 2014). However, while business executives, when asked, generally seem to acknowledge the importance of demographic trends, relatively few companies seem to take concrete action to try to develop the older market segment (Economist Intelligence Unit, 2011; Kohlbacher, 2011; Stroud and Walker, 2013). This apparently uneven responsiveness by businesses is perplexing given that these demographic developments are well known and quite predictable with time-series actuary data. Indeed, population aging is a rare situation in which a wealth of reliable information is publicly available to managers, and they routinely have to deal with a significant degree of uncertainty in relation to changes in market conditions.

Despite the fact that both normative and descriptive management literature support and recommend that firms be informed and responsive to external environments for prosperity and survival (e.g., Garg et al., 2003; Thomas et al., 1993), many firms do not seem to heed this advice when it comes to population aging. While the organizational cognition literature suggests a variety of potential reasons for the firms' inability to respond to external environmental factors, such as bias toward immediate task environment (e.g., Elenkov, 1997), bounded rationality (e.g., Thompson, 1967), and absence of recognition (e.g., Miles et al., 1974), what is lacking in the literature is concrete empirical basis for us to begin to understand why and when some companies do not respond to clear and specific evidence of population aging, while others do. Because, with finite resources, firms cannot respond to every environmental force, it is important for us to understand the extent to which they can and should respond to various environmental forces (Pfeffer and Salancik, 1978). Furthermore, population aging is a slow-moving, continuous phenomenon of increasing "environmental scarcity" (Schmitt et al., 2016) or "environmental erosion" (Cameron and Zammuto, 1983), where munificence of the external environment is in decline. We are responding to the call by Schmitt et al. (2016) for more research in the declining environment in which we do not have as rich an understanding of the organization's adaptive behavior as in a munificent environment (Schmitt et al., 2016).

To this end, in this exploratory study we are taking stock of well-established theoretical perspectives and constructs in the field of organizational cognition to grapple with the issue of the organizations' responses—or lack thereof—to population aging. Specifically, we build our conceptual model on the sensemaking perspective and empirically examine the roles of perceived state certainty, controllability, and ambivalence to the corporate-level responses (magnitude, extent) to the population aging phenomenon. By doing so, we attempt to shed light on why firms do not necessarily respond to a significant external environmental change despite the recognition and perception of it. In particular, we investigate the direct and mediating role of ambivalence on corporate (non)response. As von Krogh et al. (2012) argued, a phenomenon can play an important role in investigating and verifying the link between the general theory and the data. Thus, in this study, we test whether population aging as a challenging phenomenon serves as a link between the theories of management (i.e., "what we should expect") and the data (i.e., "what we observe"). As the expected roles and contributions of businesses in addressing economic and societal issues increase (Kudłak and Low, 2015), this study serves as both an integrative and empirical starting point to address the emerging concern about population aging and its strategic importance and business implications.

2. Conceptual background

2.1. Sensemaking, ambivalence, and controllability

According to the organizational cognition–response perspective (Daft and Weick, 1984; Weick, 1979), firms are perception and interpretation systems. Acting on behalf of organizations, when senior managers observe a phenomenon and event in the external environment (e.g., aging of populations) that is ambiguous, equivocal, confusing, or surprising, they may engage in a dynamic process of collective "sensemaking" (e.g., Brown et al., 2015; Thomas et al., 1993; Maitlis and Christianson, 2014; Weick, 1995) to interpret and evaluate its potential impact (positive or negative), meaning, and relevance for the firm. Issues and events can become meaningful and significant relative to firms' existing knowledge and frame of reference (Cowan, 1986). Positive evaluation may take the form of an assessment that the organization is likely to benefit from the phenomenon or event (i.e., an opportunity), while negative evaluation may take the form of an expectation that the same phenomenon or event will be a disadvantage (i.e., a threat) to the firm (Dutton and Jackson, 1987; Thomas and McDaniel, 1990; White et al., 2003).

The subjective evaluation of potential effect and relevance of the phenomenon to the firm are intertwined (Cowan, 1986; Dutton and Jackson, 1987) because whether its implication (or valence) to the firm is positive or negative, the fact that the valence exists indicates the presence of relevance to the firm. If the potential effect is not perceived to exist, the phenomenon becomes irrelevant to the firm. On the other hand, sometimes the evaluation of potential effect and its implication can be somewhere between positive and negative. A firm may consider the effect to be slightly positive or negative (some degree of relevance), or may feel that the positive and negative counterbalance each other and judge the effect to be neutral, in which case it is likely to become irrelevant.

The literature on social psychology offers yet a third type of interpretive attitude: "ambivalence" (Cacioppo et al., 1999; Kaplan, 1972; Thompson et al., 1995). Ambivalence occurs when one's evaluation of a phenomenon's potential implication and consequence is not fully captured on a bipolar continuum from positive to negative, but rather is expressed as *both* positive *and* negative. In this situation, the firm is confronted with, but unable to resolve, the conflicting evaluation (Ashforth et al., 2014; Fong, 2006; Piderit, 2000; Plambeck and Weber, 2010; Rothman et al., 2017). Consistent with the consensus of the literature, for this study we define ambivalence as simultaneously positive and negative evaluative attitude toward an object (Ashforth et al., 2014).

External forces typically exhibit both positive and negative implications for organizations. To act on and adapt to the changing environment one way or another without delay can be considered necessary for organizational survival (Hambrick, 1982). Therefore, ambivalence and the associated cognitive complexity can be debilitating and uncomfortable for decision makers (Ashforth et al., 2014) because they are unable to come to a decisive conclusion on relevance, which is the basis for whether to respond to it or not (Levinthal and Rerup, 2006). Thus, with no determinate judgment of relevance and cognitive inflexibility, ambivalence induces behavioral inflexibility of the firm, which manifests itself in behavioral paralysis and resistance to change (Rothman et al., 2017; Sincoff, 1990). Ambivalence, therefore, is likely to result in not only indecision and inaction, but also continued search and more elaborate sensemaking (Plambeck and Weber, 2009), or even avoidance due to the lack of justifying relevance. Altogether, there is a strong basis to argue that ambivalence delays or prohibits the organization's adaptive behaviors (Ashforth et al., 2014).

The literature also suggests, however, that an ambivalent state is not entirely undesirable. Ambivalence seems to increase the cognitive breadth and scope of attention, and receptiveness to diverse perspectives and ideas that are counter to the existing knowledge, encouraging deliberate and more balanced evaluation of multiple perspectives (Rothman et al., 2017). It may indicate the organization's cognitive attentiveness or even deliberate strategic ambiguity, the manifestation of cognitive and behavioral flexibility (Ashforth et al., 2014; Fong, 2006; Levinthal and Rerup, 2006; Piderit, 2000; Rothman et al., 2017). Although there is a credible theoretical basis to argue that ambivalence-induced cognitive flexibility promotes adaptive behavior of organizations, empirical research is generally lacking as to whether the link between them is a direct one or mediated by such variables as wisdom and mindful behavior (Rothman et al., 2017; Weick and Sutcliffe, 2006). In one notable empirical study at the individual but not organizational level, however, Plambeck and Weber (2009) found that CEOs with ambivalence regarding a strategic issue were more likely to seek response alternatives in a wider search scope and of greater novelty and risk.

In addition to ambivalence, it is known that managers also consider the dimension of agency (i.e., degree of controllability) when interpreting issues and events (Dutton and Jackson, 1987; White et al., 2003). Referring to firm's perceived controllability, however, it is important to recognize the difference between a firm's controllability of the phenomenon or event itself (the source) and controllability of its consequence. That is because a belief about the extent to which the organization can influence and deal with the source *and/or* the outcomes of it affects the firm's relevance judgment (Plambeck and Weber, 2010; Wood and Bandura, 1989). When the organization believes that it has little or no control over *both* the external phenomenon or event itself (the source) *and* the consequence of it, the issue is likely to become irrelevant to further deliberation, and subsequent response. Conversely, however, when a manager believes that the *outcome* of the event is significant and can be shaped, altered, or managed, the relevance is greater and the firm is more likely to consider taking adaptive response accordingly (e.g., domination, compromise, holism) (Ashforth et al., 2014). In their study on decision making based on a sample of hospital executives, White et al. (2003) report that lack of perceived controllability of the consequence of external environmental phenomenon and event should decrease the likelihood for the organization to respond and adapt to the changing environment. Based on the consensus of the literature based on the perception-response paradigm (e.g., Ashforth et al., 2014; Plambeck and Weber, 2010; White et al., 2003; Wood and Bandura, 1989), the firm's perceived controllability is predicated on its subjective belief about self-efficacy in dealing with the consequence or outcome that could be brought by that phenomenon, not the phenomenon itself.

The lack of adaptive responses can be devastating for a firm, particularly when the external force is significant and will endure into the foreseeable future. Remember that the lack of responses in such a case is not because the organization does not possess information, but rather it is so despite the fact that it does.

2.2. Environmental Uncertainty[1] and responses

Perceived environmental uncertainty has been frequently cited as an important determinant of managerial behavior (e.g., Ashill and Jobber, 2010; Boyd and Fulk, 1996; Doty et al., 1993; Priem et al., 2002). In general, a high level of perceived environmental uncertainty (PEU), or a *low* level of perceived environmental *certainty*, would encourage firms to seek information and learn about the facets and influences of the external environment; gaining such information should in turn reduce the PEU. When a reduced level of PEU improves managers' confidence in their understanding of the nature of uncertainty, they are more likely to be able to decide whether they should respond. On the other hand, when information

[1] Uncertainty and certainty are conceptually considered as two opposite ends on a continuum (Duncan, 1972; Milliken, 1987, 1990), where a low level of uncertainty corresponds to a high level of certainty. Each can be computationally expressed as a reverse score of the other on the Likert scale system, as this study operationalizes it by following the empirical convention of the past studies (see the Measures section).

gathering does not reduce the PEU, it can lead to indecision and/or nonresponse in addressing environmental issues and events, thus paralyzing the strategic planning and execution process (Lipshitz and Strauss, 1997; Milliken, 1987).

Milliken (1987) notes that previous research on the construct of PEU yielded inconsistent and often difficult-to-interpret results because it failed to consider different aspects and types of uncertainty relating to the environment (Ashill and Jobber, 2010; Boyd and Fulk, 1996; Doty et al., 2006; Milliken, 1990). Based on Daft and Weick (1984) process model of scanning, interpreting and learning, and responding, Milliken (1987, 1990) distinguishes three types of uncertainty (i.e., state, effect, and response) that managers experience in their endeavors to understand and interpret the environment relevant to their organizations, particularly in situations of change (see also Gerloff et al., 1991; Miller and Shamsie, 1999). Milliken (1987) specifically singles out state uncertainty as directly relating to the degree of unpredictability of the state of environment, which conceptually corresponds to the PEU of the organization.

As noted, different individuals and organizations may perceive the same environmental condition as either a threat or opportunity (Anderson and Nichols, 2007; Chattopadhyay et al., 2001), or even as "both" at the same time (i.e., ambivalence). Identifying environmental threats and opportunities requires judgment (Milliken, 1987) and thus, there exists heterogeneity in the manner in which managers respond to the same environmental conditions (Milliken, 1990) or in the manner in which they decide to respond (Grandori, 1984). Further, given the heterogeneity in organizational structure, processes, and endowed resources, firms are expected to differ in both their specific responses to external events and the performance consequences of those responses (Lee and Grewal, 2004).

3. Hypotheses

Fig. 1 represents the conceptual model of this study. At a fundamental level, firms' responses, or lack thereof, are posited as consequences of the sensemaking process that potentially reduces the perceived degree of environmental uncertainty (or *increases* the degree of *certainty*). Note that, consistent with Milliken (1990) empirical convention, the label of "certainty," instead of "uncertainty," is used to avoid potential confusion for both computational and interpretational reasons. The figure, therefore, depicts this process as an interplay among empirical variables of perceived state certainty (SC), perceived controllability (Cont), and perceived ambivalence (Ambi) as they apply to the population aging. The dependent variables in the model are the firms' corporate-level responses to population aging, and we distinguish between the magnitude (or intensity; MagResC) and the extent (or organizational pervasiveness; ExtResC) of the corporate-level response. Implicit in the model is our theoretical conjecture that some organizations may have a difficult time grappling with and responding to the population aging phenomenon not only because they perceive little agency over this macro trend but also due to their low level of perceived state certainty (i.e., *high* level of state *uncertainty*), high level of ambivalence, and lack of efficacy.

Researchers have proposed and tested a variety of organizational response process models that range from noticing issues and events to responding to them in the external environment (e.g., Cowan, 1986; Daft and Weick, 1984). The sensemaking literature offers a consensus that environmental cues (e.g., phenomena and events that are ambiguous, equivocal, confusing, or surprising) trigger a disruption of the existing understanding of the world, creating uncertainty about how to respond.

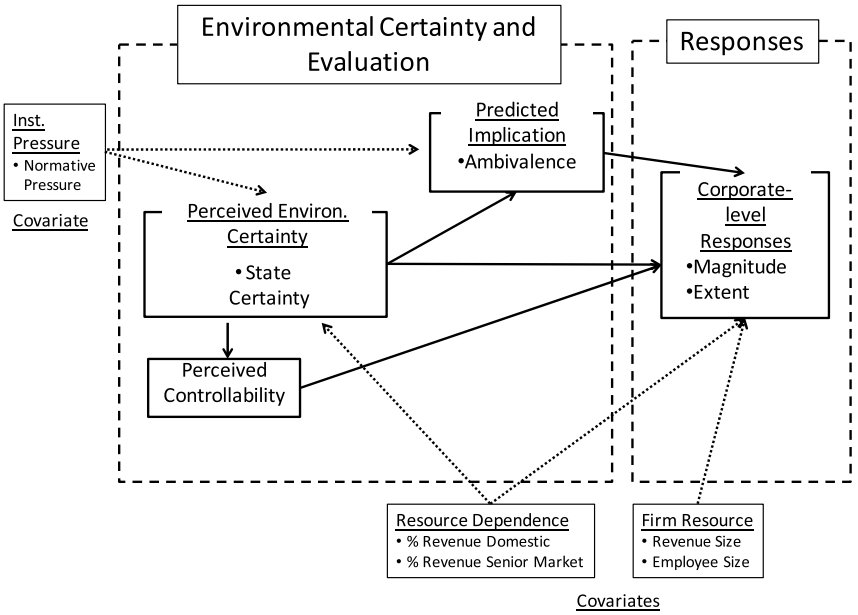

Fig. 1. Conceptual model.

However, it is "not merely interpretation and meaning production but the active authoring of the situations in which reflexive actors are embedded and are attempting to comprehend" (Brown et al., 2015: 267). In this study, our model begins with the phase in which firms detect and evaluate the specific phenomenon's (i.e., population aging's) presence and state (or state certainty; Fig. 1).

In theory, the evaluation process of the environment should reduce the uncertainty, which in turn should culminate in improved likelihood to respond (Milliken, 1987, 1990); however, it is important to note that increased state certainty constitutes discerning *judgment* about the existence and state of a specific external environmental factor (i.e., population aging), not the attitudinal inclination of managers and organizations to respond to the external environmental factor. The literature suggests that whether an organization attends to a particular phenomenon in its external environment is strongly related to its beliefs about the extent to which it can influence and deal with the consequences and outcomes of the phenomenon for the organization (Plambeck and Weber, 2010; Wood and Bandura, 1989). We believe that state certainty of population aging is a necessary antecedent for the firm's perceived controllability because it is difficult to conceive that any organization would perceive its agency and self-efficacy without being certain about the consequences. As such, Hypothesis 1 is formulated as follows:

Hypothesis 1. Perceived state certainty of population aging has a direct and positive effect on perceived controllability.

To identify a range of potential response options, managers would first need to have constructed a causal logic among their environment, firm strategy, and responses (Nadkarni and Barr, 2008). When managers perceive that they have a high degree of controllability over the consequences of external events, they are not only certain about the state of the environment (Hypothesis 1), but also have means and a self-efficacy belief to deal with the consequences. Thus, perceived controllability of population aging is critical and a necessary condition for organizations to actually respond.

As noted by White et al. (2003), environmental responses take various forms, and the magnitude of managerial responses differs. The magnitude of a firm's response conceptually refers to the intensity of the organizational reaction to external forces (Banerjee et al., 2003; Lee and Grewal, 2004), and it may operationally be equivalent to senior managers' propensity to commit more or fewer resources to the perceived external events (White et al., 2003), but may not always be so. For the corporate-level response, it is important to ascertain that such a response represents truly corporate-wide engagement, because it is entirely possible that an isolated initiative announced by corporate headquarters or the CEO is implemented only by a select few departments or even individuals (Thomas et al., 1993). Therefore, in addition to the *magnitude* the corporate-level response to population aging, it is necessary to gauge the *extent* of the corporate-level responses. These two dimensional manifestations of corporate responses are the dependent variables of this study, and we expect them to be greater when there is a strong sense of controllability (direct effect), and greater state certainty as its precursor (indirect effect). In other words, state certainty is positively related to the magnitude and extent of corporate-level responses, but such a link is plausible only when the firm holds a strong sense of controllability regarding population aging. The theoretical framework advanced by Daft and Weick (1984) provides us with guidance here. The preceding discussion on the indirect, mediated effect of perceived state certainty on corporate-level responses through perceived controllability follows the logic that organizations assume the environment as analyzable and engage with it with intrusiveness (Daft and Weick, 1984: 288–289) because this mediated route requires a sense of controllability based on the certainty of the environmental state (Hypothesis 1) and the controllability's direct and positive effect on responses. Collectively, the mediation hypothesis fits the description of the "discovering" mode in Daft and Weick's theoretical model. Summarizing the preceding discussion, we propose the following hypotheses:

H2a. Through perceived controllability of population aging, perceived state certainty has an indirect and positive effect on the magnitude of corporate-level response.

H2b. Through perceived controllability of population aging, perceived state certainty has an indirect and positive effect on the extent of corporate-level response.

However, the preceding set of hypotheses logically raises the question of whether organizations respond to a specific external environmental factor *without necessarily* having perceived controllability given the perceived state certainty. This question refers to a direct and positive effect of state certainty on corporate-level response. Again, referring to the framework of Daft and Weick (1984), the direct and positive route from the state certainty to the corporate-level responses without going through the sense of controllability suggests that organizations act on the environment while reserving the judgment of controllability and self-efficacy until later, because they consider ultimate learning would come from "enacting" on the environment through testing and experimenting (Daft and Weick, 1984: 288–289). Given that organizations may vary in their assumptions about the analyzability of environment and their degrees of intrusiveness (Daft and Weick, 1984), it is plausible that some organizations belong to the "enacting" mode of environment engagement and interpretation. Therefore, we expect that a direct and positive path from the perceived state certainty of population aging to the corporate-level responses, in both magnitude (MagResC) and extent (ExtResC), to population aging exists:

Hypothesis 3a. Perceived state certainty of population aging has a direct and positive effect on the magnitude of corporate-level response.

Hypothesis 3b. Perceived state certainty of population aging has a direct and positive effect on the extent of corporate-level response.

As discussed, perceptual heterogeneity exists among organizations in relation to the same environmental condition as threat, opportunity, or even as both at the same time (i.e., ambivalence). However, previous empirical research offers little specific guidance about the relationship between state certainty and ambivalence in the context of population aging. For instance, Rothman et al. (2017) discuss such antecedents as individual personality and relationship familiarity to individual-level ambivalence, while conflicting demands emanating from organizational change and social structures as organizational-level ambivalence. Relatedly, Rothman and Melwani (2017) propose that emotional complexity could promote cognitive flexibility, which in turn positively influences adaptive strategic decision making. Collectively, increasingly contradictory or changing internal and external environments should increase organizational ambivalence. We expect that greater environmental state certainty would more likely allow organizations to discern the opportunity–threat implications of an external environmental factor more clearly, thereby reducing potential cognitive ambivalence about the population aging phenomenon in our case. Thus, we posit the state certainty as a negative predictor to the perceived ambivalence.

Hypothesis 4. Perceived state certainty of population aging has a direct and negative effect on perceived ambivalence.

Meanwhile, we expect that the reduced level of ambivalence would in turn increase the likelihood of corporate-level responses, in both magnitude and extent, to population aging. Despite the fact that executives' interpretive ambivalence is prevalent (Plambeck and Weber, 2010), empirical literature is developing only recently to address whether being ambivalent about the effect and consequence of an uncontrollable external event increases or decreases the likelihood of actual responses on the firm level (see Rothman et al., 2017, for a review). Plambeck and Weber (2009) found that CEOs' ambivalence is positively related with the scope, riskiness, and novelty of the action responses to the enlargement of the EU, suggesting ambivalence's positive main effects on organizational responses. On the other hand, Yuan et al. (2017) found that ambivalence does not directly predict the level of corporate entrepreneurship activities (i.e., main effect), but the effect is moderated by the market capabilities of the firm (i.e., interaction effect). It is, therefore, a good empirical question whether ambivalence acts as an antecedent to organizational responses when it is predicated on the state certainty. Based on recent theoretical work by Ashforth et al. (2014), we believe that with a high level of perceived ambivalence, firms in general will be less likely to take concrete response *even if* the response alternatives are known and clear (i.e., high perceived state certainty); thus, a high level of ambivalence will have a debilitating effect on corporate-level response. As such, the likelihood of actual responses to population aging will be high (or low), given a low (or high) level of perceived ambivalence about population aging and its business implications. Hence, Hypotheses 5a and 5b are formulated as follows:

Hypothesis 5a. Perceived ambivalence about population aging has a direct and negative effect on the magnitude of corporate-level response.

Hypothesis 5b. Perceived ambivalence about population aging has a direct and negative effect on the extent of corporate-level response.

Fig. 2 depicts our hypothesized model with construct labels. The direct main effects are indicated with solid lines, while control variables' direct effects on endogenous variables are marked with dotted lines. The labels of the indirect hypotheses (Hypotheses 2a and 2b) are enclosed in dotted boxes.

4. Method

4.1. Population aging: research context and data-collection site

We selected Japan as our data-collection site to answer this study's research questions. The country offers unique opportunities for this research for several important reasons. First, Japan is the country with the oldest population in the world, and is considered a super-aging society (Kohlbacher and Herstatt, 2011; Muramatsu and Akiyama, 2011). As of October 2014, more than one-quarter (26.0%) of the entire population (127 million people) is age 65 or older (Ministry of Internal Affairs and Communication, 2014). By 2030, this is estimated to increase to 32% (Muramatsu and Akiyama, 2011). For comparison, the proportion of the population who are age 65 or older is 18.1% in the state of Florida and 14.1% in the United States overall (The US Census Bureau, 2013). Second, corporate managers and the Japanese population as a whole are highly aware of the issue of population aging, as it is a salient national media interest and a subject of daily conversation. This underlying awareness of the issue (Plambeck and Weber, 2009) among managers is necessary to investigate our research question: What are the reasons for a varied degree of organizational (non)responses to important but uncontrollable external environmental factors, such as "population aging"?

4.2. Field interviews and pretest

We retained a professional service, Central Research Services, Inc., a well-established Tokyo-based market and public-opinion survey firm and began this study by conducting exploratory in-depth field interviews with senior corporate-level executives at six Japanese manufacturing and service companies. At the end of the interviews, we asked the executives to complete a pretest version of the survey questionnaire. We also had an additional 66 senior executives of manufacturing and service companies in Japan complete the pretest instruments. In terms of the focal phenomenon, we learned from the

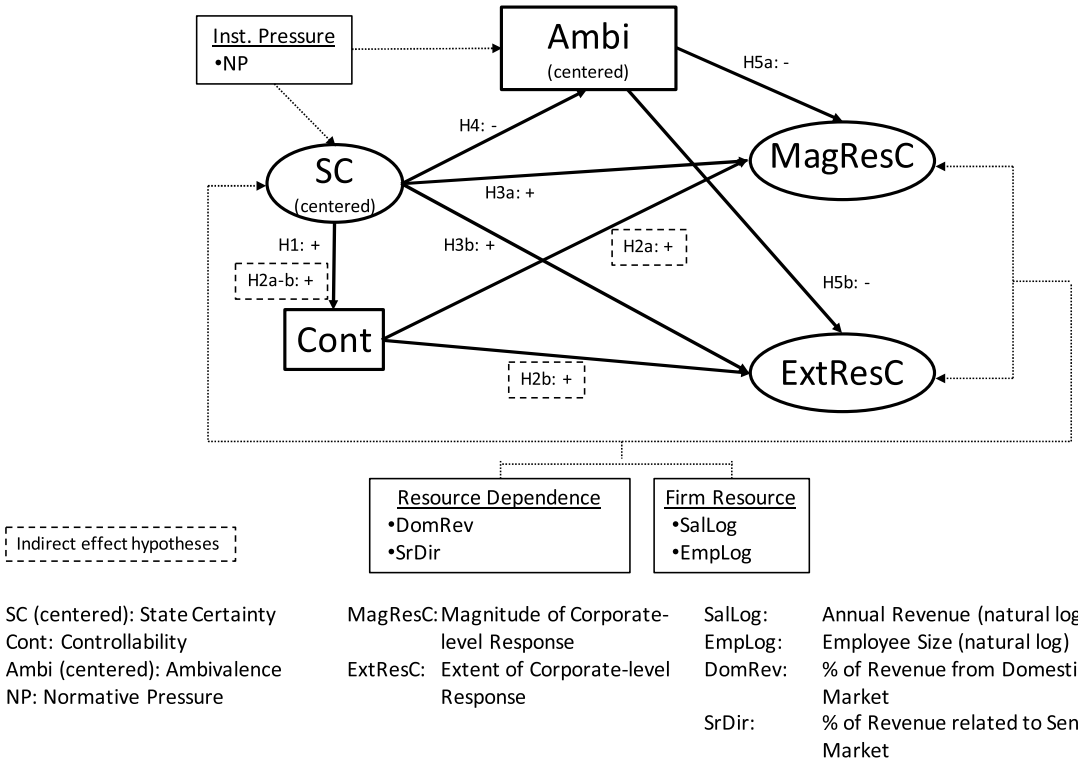

Fig. 2. Empirical model with hypotheses.

interviews that, despite the fact that most companies are aware of a wide range of external factors, a majority of the companies are preoccupied with their immediate task-environments and consider general-environments, such as demographic change, less relevant to their day-to-day operations.

Importantly, based on the pretest and interviews, we also learned about appropriate key informant profiles for this study. We contacted the CEO's office or the office of general administrative affairs of each company, explained the purpose of the study, and requested participation in the survey by a senior corporate marketing executive with corporate-level status and authority (at minimum either at vice president or managing director level) who is intimately knowledgeable about both the internal corporate-level strategy formulation process and external responses and execution in the marketplace. Note that in the Japanese organizational context, the title of “vice president” or “managing director” at the corporate level carries a significantly greater hierarchical authority than those in other countries (e.g., the U.S.) where those titles often refer to upper-middle or even middle-management ranks. From these contacts with the offices of CEO and corporate affairs, we learned that: 1) the availability of CEOs' time is too constrained for them to personally respond to surveys; 2) too often CEOs and chief operating officers (COOs) would be unavailable for survey participation due to company policy; 3) although all the corporate-level vice presidents and managing directors are familiar with the internal strategy-formulation process, not all of them are the most intimately familiar with the external executions in the marketplace; and 4) the most appropriate informants are senior corporate marketing executives. As senior corporate-level executives they are knowledgeable about a broad range of strategic and operational issues. They also frequently assume boundary-spanning responsibilities with external environments. We also benefited from the pretest responses from all 72 executives to ensure the comprehensibility, length, reliability of scales, and distribution of the responses to the questionnaire items, which allowed us to refine the instrument and develop our final version.

4.3. Data collection

The strategic business unit (SBU), the smallest autonomous organizational unit with strategy formulation and execution responsibilities, is often the level of analysis applied in strategy research. Our decision regarding the level of analysis was a challenging one in the context of this study in Japan. Throughout our interviews, the pretest, and our own experience and observations, we were reminded of a real-world diversity that exists in both forms and degrees of coordination (and uncoordination) between a corporation and SBUs across businesses in Japan. There are companies in which decision-making and actions are implemented at the level of SBU with a complete independence, while others were called SBUs only in name and organizational chart. Hence, across businesses, the definition of SBUs vary more significantly than that of

corporations, and choosing SBU as the level of analysis could be not only inconsistent but also inaccurate. Furthermore, several additional considerations were brought to our attention: 1) a highly hierarchical relationship between corporations and SBUs tends to make the former more informed about the latter than the other way around, and 2) as a data source, SBUs are often undisclosed and difficult to identify without business segment-level data, while corporations are readily identifiable as mandated by business laws and accounting regulations. The Teikoku Data Bank database is well recognized for its accuracy and is updated annually in important dimensions (e.g., annual sales revenue, employee size, locations), but reports only corporate-level data. Because we are interested in a broad range of businesses in Japan and it is not possible to obtain such a list at the level of SBU, the SBU as the level of analysis presented a significant impediment for us. After a careful deliberation with both pragmatic and methodology-related trade-offs, we chose the corporate level as the level of analysis for this study as a result, ensuring that the informants were knowledgeable about corporate-wide strategies and operations under which multiple SBUs operate.

To develop a sample for the study, we used the Teikoku Data Bank database,[2] the most comprehensive, corporate-level business database available in Japan, which lists approximately 120,000 companies that have 20 or more employees, including both manufacturing (approximately 48,000) and service (approximately 72,000) companies. With assistance from the aforementioned opinion survey firm, we derived a quota sample of 10,000 Japanese manufacturing and service companies from the database based on the employee size and industry classification by the Japanese government's national economic census. The research firm contacted the CEO's office or the office of general administrative affairs of each company, explained the purpose of study, and requested participation in the survey by a senior corporate marketing executive, while ascertaining the informants' status, authority, and knowledge. The research firm's efforts resulted in 3404 companies (i.e., executives) agreeing to receive the survey. The aggregate profile of 3404 companies in relation to industry classification code, employee size, and annual sales revenue was found to be proportionately consistent with those of the original list of 10,000 companies.[3]

As mentioned, we initially conducted a small-scale pretest with 72 executives. The instrument was originally developed in English, then back-translated and refined into a Japanese version by experienced research firm personnel and two trained bilingual graduate students and carefully checked by the bilingual authors. Our final instrument was mailed in two waves, with follow-up postcards sent to those who did not respond to the mailings. This produced responses from 576 marketing executives, a gross response rate of 16.9%. However, 31 responses were unusable due to item nonresponses on some of the focal constructs, reducing the effective response rate to 16.0% at 545 responses. These responses represent the sample for our hypotheses testing.

4.4. Measures

Measures for the constructs were sourced from extant literature (Appendix A). We purified the items by examining both substantive (e.g., breadth, consistency, clarity, and comprehensiveness of theoretical content coverage) and empirical (e.g., descriptive statistics, fits, and reliability coefficient) criteria. All measurement items after item purification, along with their standardized factor loadings, z-values, composite reliability (CR), and average variance extracted (AVE) are provided in Appendix A and a correlation matrix at the construct level is provided in Appendix B.

State certainty. For the construct of perceived environmental certainty (Milliken, 1990), we adapted a state certainty (SC) three-item scale from Ashill and Jobber (2010), the most comprehensive scale validation study of the state certainty, to our context. After dropping an item that purported to measure an organization's ability to predict and discern important environmental factors, for the lack of reliability and unidimensionality, Ashill and Jobber (2010) capture the domains of the possession of necessary information, adequacy of information, and the ability to obtain necessary information. Based on their empirical conclusion and, more importantly, the fact that our study is interested in gauging the degree of certainty/uncertainty of a specific factor (i.e., population aging) but not the ability to discern and predict the importance of it among numerous external factors, we utilized and retained their final three items. Following the original study (Ashill and Jobber, 2010) all items utilize a Likert scale but with seven, instead of five, anchor points, where 1 indicates the state of the lowest certainty (or highest *uncertainty*) and 7 indicates the state of the highest certainty, measuring the degree of certainty in the ascending continuum from 1 to 7. For the state certainty, with regard to the environmental factor (i.e., population aging), we asked how often the informants feel that they have the necessary information, whether such information is adequate, and whether they are able to obtain necessary information on a scale from never (1) to always (7). The CR for state certainty is .87; the AVE is .70.

Controllability. We measured perceived controllability (Cont) with a single-item scale adapted from Plambeck and Weber (2010). On a 7-point Likert scale, the item asked the informants to indicate their degree of agreement or disagreement to the statement that their organizations can manage the consequent changes from the population aging phenomenon.

[2] Japan's national economic census in 2009 showed that approximately 164,000 companies with 20 or more employees exist in Japan. According to the data, the manufacturing and service industry split was 1:1.9 for those companies, which is fairly well reflected in the Teikoku Databank database with the ratio of 1:1.5 among approximately 120,000 companies.

[3] Detailed profiles of the companies are available from the authors upon request.

Responses. We were interested in investigating two facets of corporate-level responses: magnitude (MagResC; three items) and extent (ExtResC; four items). For the *magnitude* of corporate-level response, we took guidance from Banerjee et al. (2003) environmentalism study and adapted their three measures to the population aging context. Their scale was particularly suited for our study because it explicitly assesses the degree to which the concern about the emerging external phenomenon with uncertain opportunity and threat implications was integrated with the firm's goals and objectives and strategic planning processes, and these were used as reflective and manifest items of the organization's response. For MagResC, we asked the respondents to indicate on a seven-point scale the extent to which their organizations' responses to population aging are integrated into corporate strategic goals, plans, and execution in a holistic and fundamental manner. The CR and the AVE are .92 and .78, respectively. Although MagResC is purported to assess the degree to which the concern about the phenomenon was integrated in the goals and objectives and strategic planning process, whether the responses are indeed executed, engaged, and acted upon throughout the organization is a separate question. To gauge the *extent* of corporate-level response, we developed four new measures to capture the extent to which the corporate-level responses to population aging are encompassing, pervasive, and shared across different functions and units within the organization. The CR and the AVE are .93 and .77, respectively.

Ambivalence. As noted, ambivalence (Ambi) occurs when an organization's cognitive subjective evaluation of an external factor's potential effect on the organization is not fully captured on a bipolar continuum from positive (i.e., opportunity) to negative (i.e., threat), but rather expressed as both positive and negative (Fazio, 2007; Schmitt et al., 2016; Thomas and McDaniel, 1990). We define ambivalence as simultaneously positive and negative evaluative attitude toward the implication and consequence of population aging. In deriving an ambivalence score that captures both, Thompson and Zanna (1995) and Plambeck and Weber (2010) offer a computational formula of $(P + N)/2 - |P - N|$, where P represents a score of positive evaluation for the company about a phenomenon and N is a score of negative evaluation of the same phenomenon. Following the procedure of Plambeck and Weber (2010), we asked the informants about their degree of subjective agreement or disagreement on a seven-point scale relating to the extent to which population aging represents a 1) positive evaluation (i.e., "the company will benefit from the population aging") or a 2) negative evaluation (i.e., "population aging is something negative for our company").

Control variables. We included several control variables that may affect the key endogenous variables (i.e., state certainty, ambivalence, organizational responses). One set of control variables relates to the size-associated slack resource of the business. For controlling the size-associated slack resource, we utilized the objective and verifiable measures of the annual sales revenue and employee headcount, both of which are available from the Teikoku Data Bank database. We transformed both annual sales revenue and employee headcount to take the form of natural log (SalLog and EmpLog, respectively, in Appendix A).

We also included another variable that could potentially influence the perceived state certainty and ambivalence about population. According to institutional theory, it is suggested that firms search information and learn about the external environment that could threaten their current and future existence and legitimacy within the society (Colwell and Joshi, 2013).[4] Among various institutional pressures, normative pressure seems particularly relevant for companies in order to interpret environmental uncertainties and decipher behavioral cues (DiMaggio and Powell, 1983). Normative pressure refers to the extent to which an organization, as a member of society, perceives social expectation to follow the behavioral norm of that society (DiMaggio and Powell, 1983). It is particularly important in the context of the Japanese business community, in which professional and industry associations often set normative expectation of the members' conduct and conformance on the issues of social importance (Haunschild and Rhee, 2004; Oliver, 1991; Vogel, 2006). It is an integral part of socialization of organizations within their institutional environment; i.e., they learn to cope and collaborate with both leading and peer organizations through various interactions in bodies such as industry and professional associations (Colwell and Joshi, 2013; DiMaggio and Powell, 1983; Oliver, 1991). Thus, the normative pressure (NP in Appendix A) could not only increase the state certainty (SC) but also reduce ambivalence (Ambi) about population aging. The CR and the AVE are .88 and .78, respectively.

In addition, as per resource-dependence theory (Pfeffer and Salancik, 1978), we included two variables that measure the company's dependence on the domestic market—percentage of total revenue generated from the domestic market (DomRev) and senior market—percentage of total revenue directly related to the market segment targeting the users of age 50+ (SrDir). We believe that these variables could positively influence not only the response magnitude (MagResC) and extent (ExtResC) but also the state certainty (SC), because it is conceivable that a company would more likely be conscious and certain about the phenomenon of population aging if it were more dependent on revenue from the domestic market and/or senior market segment.

4.5. Nonresponse and common method biases

To assess the extent of nonresponse bias, we compared the responses to our three dependent variables (i.e., the organizational responses) based on the response timing of the informants who completed the questionnaire (early or late) (Armstrong and Overton, 1977). The early respondents are those who responded to the first mailing (248 responses); those

[4] We gratefully acknowledge the suggestion made by an anonymous reviewer to account for potential institutional impact on organizational cognition and behavior.

who responded after the second mailing and phone follow-up are the late respondents (297 responses). We checked for differences in our dependent variables using t-tests and found no significant differences in the two dependent variables based on the survey-response timing. In addition, we did not find differences in the distribution of both industry classification and company size between those who responded to the survey and those who did not. Therefore, nonresponse bias does not appear to be a problem in our data.

Although we exercised a great deal of precaution in constructing the survey instrument through procedural recommendations (Podsakoff et al., 2003), common method bias is a threat to the validity of this cross-sectional study with single informants. We conducted Harman's single-factor test, by first conducting an exploratory factor analysis by using all the measurement items of the latent constructs without rotation. Two factors emerged with eigenvalues greater than 1, where the first and second factors account for 62.2% and 14.9% of variance extracted, respectively. We also fitted the confirmatory factor analysis (CFA) measurement model by first comparing the one-method-factor solution to the three-trait-factor solution. The results demonstrated that the fit with the one-factor solution was worse than the fit with the three-factor solution ($\Delta\chi^2 = 791.101$ at Δd.f. $= 3$), indicating a three-trait-factor model is a more reasonable solution. Second, we performed a procedure described in Podsakoff et al. (2003) and Liang et al. (2007), in which the variance of the responses to each indicator is partitioned into three components (i.e., trait, method, random error) by adding a method factor to the CFA measurement model with the items of the three latent factors. Although the fit was improved ($\Delta\chi^2 = 42.156$ at Δd.f. $= 10$), the improvement in comparative fit index (ΔCFI) is at .004, less than the threshold of .01 suggested as a significant and meaningful difference in the nested measurement model fit by Cheung and Rensvold (2002) based on their simulation study. It also demonstrated that the ratio of average trait variance accounts for 60.0% of the sum of trait and method variances while all the item factor loadings on the trait factors are still significant, indicating that the common method bias is not likely a significant problem for our hypotheses testing. Finally, research has established that interaction terms can be severely deflated through common method variance, making them more difficult to detect through statistical means (Siemsen et al., 2010). The fact that there still is a statistically significant interaction effect makes us even more confident that common method variance is not an issue in our study.

4.6. Measurement model and structural equation model

For the four multi-item latent constructs (i.e., SC, MagResC, ExtResC, NP), we assessed reliability and validity through a CFA measurement model with Mplus 8 using robust maximum likelihood (MLR). Each measurement item had a significant loading on its expected latent construct at $p < .001$, and all constructs had a CR of .80 or greater, meeting reliability requirements (Bagozzi and Yi, 2012). The AVE for all the latent constructs ranged from .70 to .78, exceeding the threshold of .50 suggested by Fornell and Larcker (1981) (see Appendix A). The overall fit statistics of the CFA measurement model demonstrate a good fit ($\chi^2_{(48)} = 71.834$; root mean square error of approximation [RMSEA] = .030; CFI = .992), indicating an adequate level of discriminant and convergent validities among the latent constructs to fit the structural equation model (SEM) presented in Fig. 2. Finally, to verify the significance of the indirect effects we conducted a bootstrap with 5000 samples. An inspection of the bias-corrected confidence intervals confirmed the significant results from the previous non-bootstrap estimation and thus we only report the z-values from the latter.

5. Results

Table 1 presents the Mplus estimates (completely standardized) using robust maximum likelihood (MLR) for the empirical model. Appendix B provides the correlation matrix at the construct level. The overall model fit is acceptable ($\chi^2_{(107)} = 252.14$; RMSEA = .050; CFI = .963). Among the control variables, only the annual sales revenue (SalLog) was found to be positive and significant on the two response variables, with completely standardized estimates of .190 for the magnitude of corporate-level response (MagResC; z-value = 3.777) and .177 for the extent of the corporate-level response (ExtResC; z-value = 3.393). Percentage of total revenue directly related to the senior market (SrDir) was found to be positively and significantly related to the extent of corporate-level response (ExtResC: 0.161; z-value = 3.617) and state certainty (SC: .153; z-value = 3.361). Normative pressure (NP) is positively and significantly related to state certainty (SC: .491; z-value = 9.012) but not significantly related to ambivalence (Ambi: −.078; z-value = −1.186).

In Hypothesis 1 we theorized that state certainty has a direct and positive effect on controllability (Cont), which is supported (.471, z-value = 10.057). Hypotheses 2a and 2b refer to an indirect and positive effect of state certainty on the two response variables through controllability. The indirect paths from state certainty (SC) to corporate-level responses are significant for both magnitude (MagResC: .130, z-value = 4.909) and extent (ExtResC: .092, z-value = 3.707). Consistent with the support for Hypothesis 1, both Hypotheses 2a and 2b are supported.

We examined Hypotheses 3a and 3b with particular interest, as these hypotheses propose a direct and positive effect of state certainty on corporate-level responses, the effect that directly relates to the corporate-level responses in both magnitude and extent without being mediated by controllability. Given the indirect effect of state certainty on the responses through controllability (Hypotheses 2a and 2b), Hypotheses 3a and 3b would test additional routes for state certainty's positive effect on corporate-level responses. The results demonstrate that indeed both direct paths are significant and positive: state certainty (SC) has a positive and direct effect on magnitude (MagResC: .460; z-value = 8.049) and extent (ExtResC: .420; z-value = 7.188). Therefore, both Hypotheses 3a and 3b are supported. These standardized direct effect coefficients

Table 1
Selected Mplus estimates (completely standardized).

	From	To	Hypotheses	Mplus Estimate (z-value)
Direct Paths:	SC	Cont	H1, H2a-b	.471 (10.057)
		MagResC	H3a	.460 (8.049)
		ExtResC	H3b	.420 (7.188)
		Ambi	H4	−.132 (−2.094)
	Cont	MagResC	H2a	.276 (5.592)
		ExtResC	H2b	.196 (3.926)
	Ambi	MagResC	H5a	.018 (.455)^{ns}
		ExtResC	H5b	−.025 (−.617)^{ns}
	Control variables:			
	SalLog	MagResC	–	.190 (3.777)
		ExtResC	–	.177 (3.393)
	EmpLog	MagResC	–	−.020 (−.388)^{ns}
		ExtResC	–	.009 (.163)^{ns}
	DomRev	SC	–	−.011 (−.226)^{ns}
		MagResC	–	−.001 (−.033)^{ns}
		ExtResC	–	.022 (.588)^{ns}
	SrDir	SC	–	.153 (3.361)
		MagResC	–	.066 (1.592)^{ns}
		ExtResC	–	.161 (3.617)
	NP	SC		.491 (9.012)
		Ambi		−.078 (−1.186)^{ns}
Indirect Paths:	SC	MagResC (via Cont)	H2a	.130 (4.909)
		ExtResC (via Cont)	H2b	.092 (3.707)
	Control variables:			
	DomRev	MagResC	–	−0.007 (−0.224)^{ns}
		ExtResC	–	−0.006 (−0.223)^{ns}
		Cont		−0.005 (−0.225)^{ns}
		Ambi		.001 (0.205)^{ns}
	SrDir	MagResC		.090 (3.299)
		ExtResC		.079 (3.322)
		Cont		.072 (3.171)
		Ambi		−.020 (−1.637) ^{ns}

Note: ns: not significant at $z < 1.96$ ($\alpha = .05$ level). Bias-corrected confidence intervals for indirect effects based on a bootstrap (N = 5000) are available on request.
SC = state certainty; Cont = controllability; Ambi = ambivalence; MagResC = magnitude of corporate-level response; ExtResC = extent of corporate-level response; NP = normative pressure; SalLog = company size (revenue); EmpLog = company size (employee); DomRev = % domestic revenue; SrDir = % revenue senior market.

(Hypotheses 3a and 3b) are far greater than those of indirect effects (Hypotheses 2a and 2b), suggesting that a stronger connection between state certainty and corporate responses is in the direct route than in the indirect route through higher perceived controllability (see Table 1).

Hypothesis 4 predicts that state certainty (SC) has a direct and negative effect on perceived ambivalence (Ambi) relating to the phenomenon of population aging. The results demonstrate that SC has a direct and negative effect on Ambi (−.132; z-value = −2.094), thus providing support for Hypothesis 4. For the phenomenon of population aging, we found that the higher the level of perceived state certainty about population aging, the lower the level of ambivalence perceive by organizations.

We also predicted that ambivalence would have a direct and negative effect on both magnitude (Hypothesis 5a) and extent (Hypothesis 5b) of the corporate-level response. That is, the lower the level of perceived ambivalence about population aging, the greater the level of the responses to the phenomenon. Unexpectedly the two direct paths are found nonsignificant at the $\alpha = .05$ level. For the magnitude (MagResC), the path coefficient was .018 (z-value = .455), and for the extent (ExtResC) it was −.025 (z-value = −.617), indicating ambivalence has little direct effect on either measure of corporate response. Therefore, both Hypotheses 5a and 5b are rejected.

5.1. Post-hoc analysis

The unexpected rejection of Hypotheses 5a and 5b based on the nonsignificant direct path coefficients from ambivalence to the responses posed an intriguing question: what could explain the lack of support for the negative influence of ambivalence on organizational responses, which has both theoretical and intuitive appeals? In an effort to learn about the relationship, we re-estimated our model with additional paths by incorporating a moderating effect of ambivalence on the relationship between state certainty and the two response variables. Our conjecture was that the perceived ambivalence did not directly reduce the level of organizational responses but in an indirect manner in conjunction with the perceived state certainty, given the significant, direct, and positive effects of state certainty (SC) on both the magnitude and extent of corporate-level response (MagResC and ExtResC) in Hypotheses 3a and 3b and significant, direct, and negative effect of state certainty (SC) on ambivalence (Ambi) in Hypothesis 4.

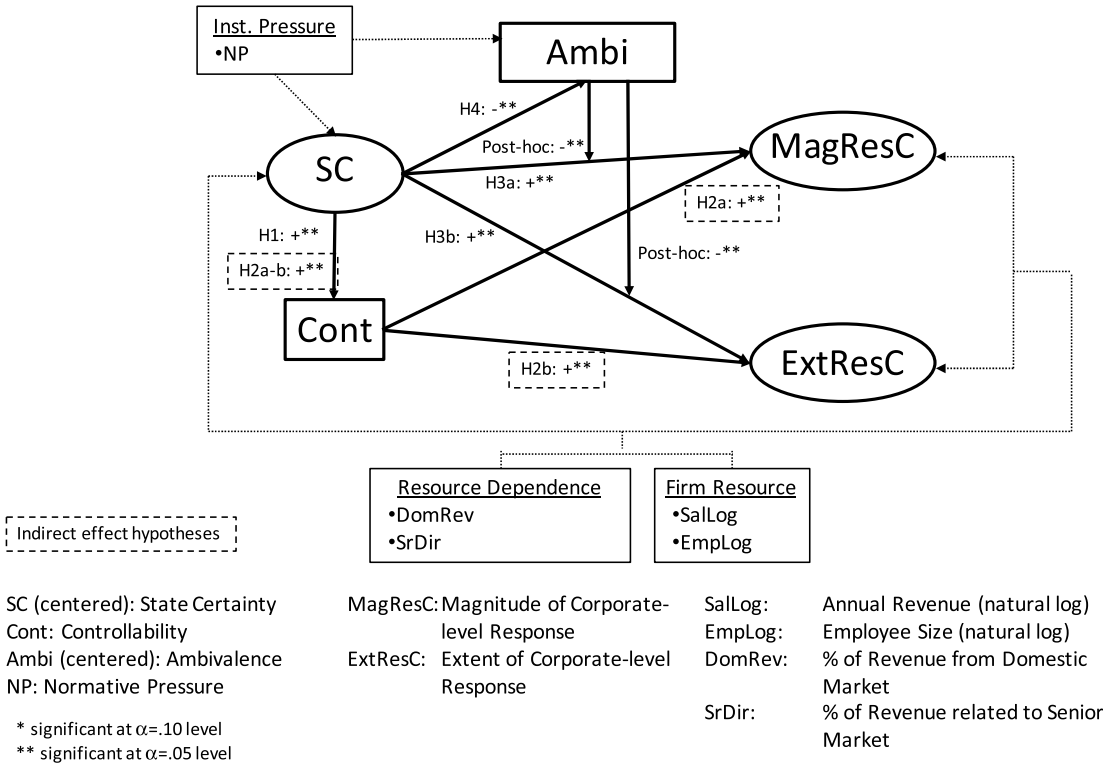

Fig. 3. Empirical model with hypotheses testing results.

Although there are several analytical approaches suggested for the SEM with a noncategorical moderator (see Marsh et al., 2012, for a review), we followed the latent moderated structural equations (LMS) approach (Klein and Moosbrugger, 2000) that is implemented in Mplus (Muthén and Muthén, 2015).

The model and results from the post hoc model fitting are provided in Fig. 3 and Table 2, respectively. All the hypothesized relationships in the original model are found unchanged in this post-hoc model, indicating the stability of the original empirical model. The interaction term was found significant both on magnitude of corporate-level response (MagResC) and on extent of corporate-level response (ExtResC), providing support for our post-hoc conjecture of the moderating effect of ambivalence on the relationship between state certainty and the corporate-level response. The Mplus estimates (unstandardized) for the path from SC*Ambi to the response variables are both negative, and significant at $\alpha = .05$ level for MagResC $-.066$ (z-value $= -2.314$), and ExtResC $-.058$ (z-value $= -2.130$).

Because perceived ambivalence (Ambi) is significantly related to an independent variable (SC) but not to either dependent variable (MagResC, ExtResC), ambivalence is considered to be a quasi-moderator (Sharma et al., 1981) between SC and MagResC and ExtResC in the post-hoc model. In summary, when perceived ambivalence about population aging is high, the effect of SC on MagResC and ExtResC will be reduced, and when it is low, SC's effect on the corporate-level responses to population aging will be increased. In other words, ambivalence can be conceived as a negative contingent variable on the positive relationship between the perceived state certainty and the magnitude and extent of corporate response to population aging.

6. Discussion and implications

Kulik et al. (2014: 934) stated that an "aging population is a cause for celebration: it is surely a positive thing that so many people can look forward to longer, healthier lives. But, an aging population is forcing dramatic changes in national policy, organizational structures, and individual lives. Globally, we are at a critical turning point. Management scholars have an incredible opportunity to participate in and shape the discussion on the aging population, and to contribute research that helps policymakers, managers, and individual workers to make better, more informed decisions."

In this study, we took stock of well-established perspectives and constructs to investigate the question of organizations' (non)responses to one of the grand challenges of our time, a population aging phenomenon, thus extending previous theoretical and empirical studies on organizational responses. By basing our conceptual model on the sensemaking perspective, we explored the roles of perceived state certainty in increasing perceived controllability and reducing ambivalence, which in turn led to the corporate-level responses (magnitude, extent) to a phenomenon of "environmental scarcity"

Table 2
Interaction term added selected Mplus estimates (unstandardized).

	From	To	Hypotheses	Mplus Estimate (z-value)
Direct Paths:	SC	Cont	H1, H2a-b	.432 (8.047)
		MagResC	H3a	.637 (6.143)
		ExtResC	H3b	.558 (5.761)
		Ambi	H4	−.209 (−2.102)
	Cont	MagResC	H2a	.311 (4.818)
		ExtResC	H2b	.205 (4.818)
	Ambi	MagResC	H5a	.037 (.851)^{ns}
		ExtResC	H5b	.004 (.103)^{ns}
	SC*Ambi	MagResC	H5a	−.066 (−2.314)
		ExtResC	H5b	−.058 (−2.130)
	Control variables:			
	NP	SC		.518 (8.164)
		Ambi		−.126 (−1.150) ^{ns}
	SalLog	MagResC	–	.128 (3.851)
		ExtResC	–	.117 (3.654)
	EmpLog	MagResC	–	−.030 (−.575)^{ns}
		ExtResC	–	−.003 (−.055)^{ns}
	DomRev	SC	–	−.002 (−.506)^{ns}
		MagResC	–	−.001 (−.302)^{ns}
		ExtResC	–	.002 (.491)^{ns}
	SrDir	SC	–	.069 (3.584)
		MagResC	–	.029 (1.459)^{ns}
		ExtResC	–	.071 (3.403)

Note: ns: not significant at $z < 1.96$ ($\alpha = .05$ level).
SC = state certainty; Cont = controllability; Ambi = ambivalence; MagResC = magnitude of corporate-level response; ExtResC = extent of corporate-level response; NP = normative pressure; SalLog = company size (revenue); EmpLog = company size (employee); DomRev = % domestic revenue; SrDir = % revenue senior market.

(Schmitt et al., 2016) in Japan. Our hypotheses are mostly supported with some intriguing exceptions. Below we address several of our key findings.

The first key finding relates to an organization's perceived ambivalence about the phenomenon of population aging. At a general level, the debilitating effect of ambivalence does not occur in a direct or anticipated manner: ambivalence has a quasi-moderating effect on the relationship between state certainty and the magnitude and extent of corporate-level response. Finding such an effect required a post hoc additional analysis prompted by the unexpected finding of a nonsignificant direct effect of perceived ambivalence about population aging on responses. Our analysis indicates that when organizations are ambivalent about population aging's implications for them, the effect on the two corporate-level response variables of state certainty are significantly diminished at different levels of statistical significance (Table 2). These findings contribute to a more fine-grained understanding of the way that high PEU (or low state certainty) can paralyze firms from addressing and incorporating environmental issues and events in their strategic planning and execution process (Lipshitz and Strauss, 1997; Milliken, 1987). Indeed, our research suggests that the paralyzing effect of high PEU is not only a simple direct effect: it is also enhanced by the presence of ambivalence. An apparent enigma of firms' no or low responses despite the acknowledgement and awareness of the population aging phenomenon can be partly explained by the ambivalence.

Our study complements a recent work by Ashforth et al. (2014) that provides a theoretical framework that organizes potential organizational responses to ambivalence, in which the potential response actions are classified based on positive evaluation axis and negative evaluation axis. Our single-item ambivalence measure was derived by utilizing positive and negative evaluation scores, which yields the highest score with a combination of high positive and high negative scores ("high-high" combination). According to Ashforth et al. (2014: 1465) the "high-high" combination, however, would produce a holism response, which involves "the complete, simultaneous, and typically conscious acceptance of both opposing orientations." The holism is described as a proactive attitude toward a holistic response, being tolerant to, or even embracing, the intensely opposing orientations (Ashforth et al., 2014). Interestingly our results seem to be contradictory to the description of the holism but instead consistent with the "low-low" combination, which would produce an avoidance response. Clearly more research is needed to understand the intricate roles that each evaluative attitude (positive and negative) seems to play in influencing organizational responses and strategic renewal behaviors (Schmitt et al., 2016). As the holism responses are "less well understood and more complex" (Ashforth et al., 2014: 1461), empirical comparisons between avoidance and holism seem particularly important to understand the (non)responses to the population aging. One intriguing possibility is the moderating role of culture on the relationship between ambivalence and responses. A recent study in cross-cultural psychology (Brown, 2013) indicates that Japanese individuals are more self-ambivalent than Americans and Americans are more positive and less negative about themselves than their Japanese counterparts. Although Brown (2013) study is based on individuals' evaluative attitudes toward themselves and therefore no direct comparison to the firms' attitude toward an external environment is prudent, it raises the importance of investigating the cross-cultural context of positive and negative evaluations because of the global nature of population aging issues.

Second, we explored the noticing–interpretation–response connection to explain an organization's response, or lack thereof, to an important but uncontrollable external environmental factor, namely a population aging phenomenon. Our model reveals the existence of two different paths, direct and indirect, for organizational response to the phenomenon of population aging, providing strong empirical support for Daft and Weick (1984) much earlier theoretical work on interpretive mode classification. We found that, while the indirect route (Hypotheses 2a and 2b) from state certainty to the corporate-level responses to population aging mediated through an increased sense of controllability—the "discovering" mode—is present and significant in the data, a direct route (Hypotheses 3a and 3b) from state certainty to the responses—"enacting" mode—also exists. To the best of our knowledge, there is no published study that specifically reports empirical validation of the theoretical paths. Intriguingly, closer examination of the standardized path estimates from state certainty (SC) to responses (MagResC, ExtResC) demonstrates that the direct paths (.460 and .420, respectively) are greater than the indirect paths (.130 and .092, respectively) (see Table 1). Perhaps for an external environmental factor such as an aging population, which is important but not directly controllable for organizations, the responses are based less on the indirect route through the sense of controllability (i.e., the ability to influence the potential outcomes of population aging). Given the limited scope, it would be premature to draw conclusions from this study alone; however, it provides us with preliminary evidence that responses to external environmental forces are motivated more by organizations' desire to directly engage, shape, and author the answer(s) to the population aging issues than by the discovery and conviction of a "correct answer already in an analyzable environment" (Daft and Weick, 1984: 289). More empirical research is needed to qualify this discovering vs. enacting conjecture as it relates to the general environments.

6.1. Managerial implications

Several practical implications based on this study can be offered. Most importantly, our results indicate that ambivalence about population aging is not helpful in responding to the uncontrollable external force that is slow-moving and continuous. At a fundamental level, continued engagement in environmental scanning is critical to reduce ambivalence by increasing state certainty. Once state certainty is increased, two alternative paths for responses—direct and indirect—are available. If an organization can be described more as a "discovering" type of organization than an "enacting" type of organization, it is important for the organization to attain a greater sense of controllability. That is, knowing the range of potential response options to deal effectively with the phenomenon is critical for the discovering-type to committing to act on environment influences. Conversely, enacting-type organizations seem to be more predisposed to respond to environmental phenomenon without a high degree of sense of controllability. The responses of such organizations may or may not be correct, but the crucial point for enacting-type organizations is to learn from their responses. Here, leadership's role is to ensure that such learning occurs and is internalized for their ongoing chain of cognition–response processes (Daft and Weick, 1984; Weick, 1995).

It is also notable that, in spite of the fact that many organizations recognize the state of population aging as real, the level of state certainty does not necessarily lead to actions due to the cognitive ambivalence. An 'opportunity-or-threat' is a powerful motivator for organizations, but an 'opportunity-and-threat' is not. For an organization to act on, the phenomenon and its implied challenges have to become clear as a strategically relevant issue to be resolved. Here, we believe that the organization's leadership plays an important role in *sensegiving* to reduce ambivalence by clearly communicating the opportunity/gain–threat/loss implications of the state. The organizational members need to understand what is at stake for the organization with regard to the population aging.

Finally, an organizing framework (Table 3) can be offered in a matrix form to aid those managers who need to explore and conceptualize a diverse range of potential responses, in both magnitude and extent, to the population aging. Although not intended as prescriptive guidance for what the response should be, the matrix can be used to facilitate the discussion and evaluation of what some of the responses could be.

6.2. Theoretical implications and future research

We would also like to draw attention to a wide range of relatively unexplored research opportunities on firms' responses (or lack thereof) to external factors that are important to but not directly controllable by any single organization. Recent discourse on grand challenges, such as climate change (Howard-Grenville et al., 2014), natural resource management (George et al., 2015), slow progress in healthcare reform and innovation (Ferlie et al., 2005), and natural disasters (Olcott and Oliver, 2014; Shepherd and Williams, 2014), is reflective of our quandary of general environmental factors that have significant implications beyond management practice and research. These examples represent a mix of phenomena that are all largely uncontrollable, but some are slow-moving and continuous while others are abrupt and discrete. For example, natural disasters constitute an abrupt, observable, well-known, hardly controllable, low-probability high-impact plight. For some types of disasters (e.g., hurricane, tornado, and earthquake), there exists certain information for us to anticipate and prepare for them (e.g., that a certain type of disaster is likely to occur sooner or later; that a certain region is more prone to a particular type of disaster). However, it is not possible to make exact predictions such as when the disaster is going to strike (state uncertainty); what effect it may have on an organization; and, therefore, it is arduous for the organization to decide whether and how it should prepare and subsequently respond. Cognitive ambivalence should loom large in a decision-making situation like this, and we need to explore more about antecedents and consequences.

On the other hand, for those uncontrollable forces that are slow-moving and continuous, our findings on population aging should provide an intriguing starting point for further empirical exploration. Specifically, it is conceivable that the roles of

Table 3
Organizing framework of potential responses.

		Extent	
		Small	Large
Magnitude	Small	**Non-substantive and localized responses** Examples: • Budget was earmarked to hire an intern to study long-term impact of population aging on major market segment • A task force was created to estimate competitors positions in the elderly market segment (e.g., market share, profitability).	**Non-substantive, yet widely spread responses** Examples: • Several departments independently came up with a 'low-hanging-fruit,' one-time action. • Several niche products/services for the elderly market segments were introduced for a limited time by different departments.
	Large	**Strong, substantive, but narrow/localized responses** Examples: • A small new corporate venture team was created to develop a special market niche. • A major decision was made to withdraw from a shrinking children's segment in Japan. The company was evaluating the possibility of entering an elderly market segment for this particular service.	**Strong, substantive, and organization-wide responses** Examples: • A new corporate mission/strategy/process were developed and implemented to address the threat of population aging on existing market segment. • With specific action items and numerical targets, the company's commitment to address the threat of population aging was publicly announced in the annual shareholder's meeting.

controllability and ambivalence may be contingent on the nature of a particular external environmental factor. Population aging constitutes a gradual, continuous change, which can be called "environmental scarcity" (Schmitt et al., 2016) or "environmental erosion" (Cameron and Zammuto, 1983: 364) where munificence of external environment is being depleted slowly. It has long been predicted and is commonly known to be occurring, which means that cognitive "attention" *per se* is not the difficult part, although responses by individual organizations vary considerably. Because of its continuity, predictability, and even "knowability" of this specific factor, population aging does not fully represent a broad and diverse set of external environmental factors. It would be, therefore, fruitful for future research to explore and explicate a variety of external forces in terms of these dimensions.

Finally, by analyzing the effect of ambivalence we contribute to the organizational cognition literature (e.g., Bromiley and Rau, 2016; Narayanan et al., 2011; Plambeck and Weber, 2010). So far, the literature does not offer clear guidance as to the effects of ambivalence on the linkage between sensemaking and response. By probing its moderating effect our study goes beyond an analysis of linear effects only. As our results suggest, depending on the level of ambivalence, the relationship between the perceived environmental certainty and managerial response might be rather nonlinear.

In the spirit of continuous improvement, we wish to acknowledge several major opportunities that address the limitations of this study. Although we believe this study contributes to sketching an exploratory map of research opportunities related to population aging, the cross-sectional study design with a single informant has limitations. The informants' individual traits (e.g., age) could bias their responses and multi-informant design could alleviate this concern. In addition, a longitudinal study design in future research is recommended. Specifically, population aging is a slow but persistently progressing phenomenon, whose saliency will loom ever larger over time. How does the increasing awareness of the phenomenon affect firms' perceptions of uncertainty and response? Does the increasing saliency over time indeed lead to greater perceived certainty, more controllability, less ambivalence, and ultimately more response? Causal inferences in our model should be tested with a longitudinal design with repeated measures. Furthermore, the hierarchical nature of Japanese organizations may impede the organization-wide flow of information regarding external environmental changes, especially when such information is at odds with the senior executive's existing belief. This could in turn stymie the corporate-level response as a whole.[5] Multi-informant design could address this limitation of our study.

Another set of research opportunities lies in the replications of this exploratory study in a variety of environmental contexts and phenomena. Our current study was conducted in Japan, which is the most aged nation in the world. Although we controlled for the corporate-level responses by incorporating factors such as firms' slack resource and resource dependence in the model, we still found significant variations in certainty perception and actual responses related to population aging even in this most aged society. As such, it would be worthwhile to investigate whether our findings are applicable to other countries. As there are a number of countries at various economic development stages (e.g., Germany, Italy, South Korea, and China) whose populations are following in Japan's footsteps demographically, more knowledge on firms' (non)responses should be of great interest to academics, managers, and policymakers. Thus, continuing efforts to establish the external validity of our findings based on population aging should be pursued across different countries and in consideration of other external factors.

[5] We gratefully acknowledge the suggestion of organizational information flow issue made by an anonymous reviewer.

APPENDIX A. Measures

Construct, label, # of items, Composite Reliability (CR), AVE[a]	Variable Label	Item	Standardized Factor Loading (z-value)[b]	Source
State certainty (SC) 3 items CR: .87 AVE: .70 7-point scale	SC01	How often do you feel you have the information you need in order to understand how the 'population aging' phenomenon will change in the future? (never/always)	.80 (34.58)	Source: Ashill and Jobber 2010 (based on Milliken, 1990)
	SC02	How often do you believe the information you have about the 'population aging' phenomenon is adequate for your management decision making? (never/always)	.88 (39.71)	
	SC03	How often do you feel you are able to get the necessary information about the 'population aging' phenomenon for your management decision making? (never/always)	.83 (34.42)	
Controllability (Cont) 1 item 7-point scale	Cont	To what extent do you agree with the following statements? "Our company can manage the changes resulting from the 'population aging' phenomenon."	–	Plambeck and Weber (2010)
Magnitude of corporate-level response (MagResC) 3 items CR: .92 AVE: .78 7-point scale	MagResC01	Our firm has integrated issues concerning the 'population aging' phenomenon into our strategic planning process.	.89 (57.02)	Based on Banerjee et al. (2003)
	MagResCS02	In our firm, total quality management includes reducing the negative impact of the 'population aging' phenomenon on products and processes.	.84 (28.65)	
	MagResC03	At our firm we make every effort to link objectives pertaining to the 'population aging' phenomenon with our other corporate goals.	.92 (68.26)	
Extent of corporate-level response (ExtResC) 4 items CR: .93 AVE: .77 7-point scale	ExtResC01	Our firm's response to 'population aging' phenomenon encompasses many things we do internally.	.89 (54.24)	New Measures
	ExtResC02	Our firm's response to the 'population aging' phenomenon involves most functional units of our organization.	.89 (57.24)	
	ExtResC03	Our firm's response to the 'population aging' phenomenon encompasses many things we do externally.	.90 (62.91)	
	ExtResC04	Different geographical units are fully involved in our firm's response to the 'population aging' phenomenon.	.83 (34.51)	
Ambivalence (Ambi) 1 item 7-point scale Note: 2 items (positive and negative) are used to calculate a single-item scale	Ambi_P Ambi_N	Positive Interpretive Evaluation To what extent do you agree with the following statements? "Our company will benefit from the 'population aging' phenomenon." Negative Interpretive Evaluation To what extent do you agree with the following statements? "The 'population aging' phenomenon is something negative for our company."	–	Adapted from Plambeck and Weber (2010) Ambi = (Ambi_P + Ambi_N)/2 − |(Ambi_P − Ambi_N)|
Control Variables				
Normative Pressure (NP) 2 items CR: .88 AVE: .78 7-point scale	NP01	Our industry expected all firms to be proactive and responsible in addressing 'population aging.'	.88 (33.17)	Colwell and Joshi (2013)
	NP02	Our industry expected all firms to be proactive and responsible in addressing 'population aging.'	.89 (35.14)	
Company size (revenue) 1 item	SalLog	Natural log of annual sales revenue in Japanese Yen	–	Teikoku Data Bank Database
Company size (employee) 1 item	EmpLog	Natural log of employee headcounts	–	Teikoku Data Bank Database
% Domestic revenue 1item	DomRev	Approximately what percentage of your company's revenue is generated in: Domestic market: ___% Foreign market: ___%	–	Newly developed

(*continued on next page*)

(*continued*)

Construct, label, # of items, Composite Reliability (CR), AVE[a]	Variable Label	Item	Standardized Factor Loading (z-value)[b]	Source
% Revenue senior market 1 item 10-point scale	SrDir	Approximately what percentage of your business is directly related to the so-called 'senior market' (defined as users aged 50+) as end-users? (Note: End-users may be consumers or business users.) [1 = 0–10%, 2 = 11–20%, 3 = 21–30%, 4 = 31–40%, 5 = 41–50%, 6 = 51–60%, 7 = 61–70%, 8 = 71–80%, 9 = 81–90%, 10 = 91–100%]	–	Newly developed
Post-hoc analysis interaction term of Cert and Ambi 1 item		Cert*Ambi(centered)	Latent moderated structural equations (LMS) approach (Klein and Moosbrugger, 2000) that is implemented in Mplus (Muthén & Muthén,2015) using the XWITH command.	
–				

[a] AVE: Average Variance Extracted.
[b] Significant when (z-value) >1.96 at $\alpha = .05$.

APPENDIX B. Construct Correlation Matrix

Variables	Mean	Std. Dev.	1	2	3	4	5	6	7	8	9	10
1. State certainty	.139	1.306	1.000									
2. Magnitude of corporate-level response	2.558	1.604	.624**	1.000								
3. Extent of corporate-level response	2.401	1.455	.584**	.883**	1.000							
4. Controllability	4.266	1.081	.471**	.508**	.429**	1.000						
5. Ambivalence	1.994	3.163	−.173**	−.111*	−.142**	−.145**	1.000					
6. Company size (revenue)	8.410	3.891	.103**	.238**	.240**	.048**	−.029 *	1.000				
7. Company size (employee)	4.966	1.481	.109**	.190*	.208**	.051**	−.029*	.731**	1.000			
8. % Domestic Revenue	95.576	171.016	.050	.029	. .060	.024	−.013	−.054	−.089	1.000		
9. % Revenue Senior Market	3.552	7.112	.299**	.245**	.325**	.141**	−.063**	.032	.101*	.138**	1.000	
10. Normative pressure	.000	1.166	.536**	.368**	.365 **	.252**	−.148**	.198**	.189**	.082	.300**	1.000

Note: Std. Dev. = standard deviation.
**significant at the .01 level (2-tailed).
*significant at the .05 level (2-tailed).

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